

## REMARKS

Examiner Sarkar is thanked for his thorough examination of the Subject Patent Application. Referring to the rejections of all Claims (1- 25) under 35 USC 102(e), as being anticipated by Leitz et al (US Pat No. 2004/0087117 A1), arguments for allowance of these claims are next addressed. The critical and unique claim of Applicant's invention is a graded semiconductor alloy layer comprised with a germanium component in which the content of the germanium component in the graded semiconductor alloy layer **is greatest at the semiconductor alloy layer - underlying substrate interface, with germanium content decreasing during growth of the graded semiconductor alloy layer thus resulting in the lowest germanium content at the top surface of the graded semiconductor alloy layer.** This unique graded layer results in the largest mismatch at the semiconductor substrate - graded semiconductor alloy interface which will ultimately allow a non-graded overlying silicon - germanium layer to be grown in a relaxed form, while burying the unwanted threading dislocations near the graded semiconductor alloy layer - semiconductor substrate interface.

Examiner contends the Leitz patent is the same as applicants referring to Fig. 4 of the Leitz invention. However Examiner is referring to seed layer 420 not the critical graded semiconductor layer 440. Applicant does not need or use a seed layer. Please carefully study Fig. 4, wherein layer 440 is the graded semiconductor alloy layer (to be compared to applicants invention) with an **overlying cap layer 450**. It is obvious from Fig. 4 that the highest concentration of germanium is at the **top surface of layer 440** not the bottom surface as Examiner claims. This is in exact **contrast**


to applicant's invention in which Fig. 4 in applicants invention as well as the text clearly describe the lowest germanium concentration at the top surface of the graded semiconductor alloy layer. This is applicant's major point, burying threading dislocations at the bottom of the graded layer thus allowing an overlying strained silicon layer to be grown with a reduced risk of propagating threading dislocations. Examiner please explore this major process difference between applicant and the Leitz inventions.

Examiner on page 5 of the Final Office Action refers to layer 420 of the Leitz invention as the graded layer, however unlike applicants invention Leitz continued to grow the critical thicker graded semiconductor alloy layer 440, needed for burying of threading dislocations in an overlying layer, with layer 440 showing a germanium grading profile exactly opposite applicants. That layer (440) is the critical layer in which applicant bases his invention on, not a seed layer such as layer 420 of the Leitz invention. Seed layer 420 of the Leitz invention is not needed in applicants invention. Applicant clearly teaches a semiconductor alloy layer graded to result in the lowest concentration at the top surface wherein in direct contrast Leitz teaches a counterpart layer 440 with a undesirable highest concentration at the top surface.

It is strongly believed that Applicant's process for the graded semiconductor alloy layer, uniquely different from the Leitz et al prior art obtained via a different growth procedure, clearly shows the needed process differentiation from prior art and therefore reconsideration of the rejection of all claims under 35 USC 102 is requested.

CS03-054

It is requested that should Examiner Sarkar not find that the Claims are now Allowable that he call the undersigned attorney at 845-452-5863, to overcome any problems preventing allowance.

 Respectfully submitted,  
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